

Space News Roundup

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No. 24

Station clears funding subcommittee

By Kari Fluegel

The International Space Station last week passed the first round of Congressional voting even though legislators mandated more than \$240 million in additional cuts for NASA.

The House Appropriations subcommittee voted last week to fully fund the station project, while cutting several other programs and science initiatives in the White House budget request.

"Given the enormous challenge that (Subcommittee) Chairman (Louis) Stokes (Ohio-D) and the members of his committee had in adequately addressing the many needs of the agencies covered in this budget, NASA is pleased with the markup," said NASA Administrator Daniel Goldin.

With last week's cuts, NASA's budget for the 1995 fiscal year is down to a little more than \$14 billion which is \$527 million less than

Budget challenges remain ahead

FY94 and \$240 million less than the White House request.

Of the additional \$240 billion NASA will be required to trim, \$127 million will come from the shuttle program with the remainder cut from personnel and administration.

Goldin said the agency will work hard to find places to save the money.

"NASA has stepped up to the budget challenge and adopted a lean management approach to meet the President's mandate to do more with less," he said. "Over the last 18 months we've cut billions from the NASA budget and we're pleased to comply with the further challenges Mr. Stokes has presented in the markup. We want to be part of the solution, not part of the problem.

"We've worked with the Office of Management and Budget and other agencies to pare our budgets, satisfy the tough goals set by Congress and keep the President's budget priorities intact. In the weeks ahead we will continue to work with Chairman Stokes and his committee as we proceed with the difficult task of accommodating competing priorities within the allocation."

The subcommittee's action was well received in the Space Station Program Office here at JSC.

"We have worked hard over the last year to refocus the station program and incorporate several major changes. I think the support of the subcommittee is an indicator of our success," said Program Manager Randy Brinkley. "We are reassured that the space station is recognized

as a national priority."

Since the time Congress voted on station funding, the program has undergone a major redesign including the consolidation and reorganization of the management organization with JSC as host center. Boeing was named prime contractor with responsibility for the sub-contractors' work, and a new management structure was implemented using Integrated Product Teams to work issues with all parties as they develop.

Perhaps, the most dramatic change, however, is the inclusion of Russia as an international partner in the space station. Russian involvement will enable cost and schedule savings, earlier on-orbit research opportunities and increased science capabilities,

Brinkley said.

Construction of the station is expected to begin in December 1997. Funding for the station is capped at \$2.1 billion per year, for a remaining cost of \$17.4 billion through the completion of assembly in 2002.

The International Space Station will consist of an U.S. laboratory module, an U.S. habitation module, an European Space Agency module, a Japanese Experiment module, the Canadian-built robotic arm, a Russian service module and several Russian research facilities.

The full House of Representatives is expected to vote on the NASA FY'95 appropriation later this month. The Senate appropriations vote will follow.

"Though the subcommittee vote was an important milestone, we still have a lot of work to do before this year's budget battles are completed," Brinkley said.



ORBITER TRANSFER - *Discovery* rolls out of the Orbiter Processing Facility where it was stored temporarily when *Atlantis* returned to Kennedy Space Center following its refurbishment. The orbiter now rests in the Vehicle Assembly Building. *Discovery* will fly next on STS-64, following the July launch of *Columbia* on STS-65 and *Endeavour* on STS-68 in early August.

Columbia rolls to pad as preparations enter final stretch for flight

By James Hartfield

Now pointed skyward, *Columbia* moved to the launch pad Wednesday and into the home stretch of preparations to lift off July 8 on a two-week International Microgravity Lab-2 flight.

Columbia's crew for STS-65 — Commander Bob Cabana, Pilot Jim Halsell, Payload Commander Rick Hieb, Mission Specialists Leroy Chiao, Don Thomas and Carl Walz, and Japanese Payload Specialist Chiaki Mukai — will take part in a dress rehearsal countdown at Pad 39A Wednesday. This week, *Columbia* was hoisted vertical and attached to the STS-65 solid rockets and fuel tank during six days in the Vehicle Assembly Bldg. Other work included a flight readiness test of the main engines and aerosurfaces.

Meanwhile, work to prepare *Endeavour* for a mid-August launch on STS-68, the second Space Radar Lab flight, continued in KSC's Bay 1 processing hangar. *Endeavour's* three main engines have been installed and were secured this week in the aft compartment. Other work included tests of the brake anti-skid devices; removal of auxiliary power unit 1, one of three units that generate power for the orbiter's hydraulics; and the replacement of an aft reaction control system thruster on the left orbital maneuvering system pod.

Endeavour's ammonia cooling system, used to cool the APUs, also was serviced for flight.

In the Vehicle Assembly Bldg., the solid rockets for *Endeavour* on STS-68 are stacked and were joined with the external fuel tank this week.



However, *Endeavour* still has more than a month to go before it is rolled over to meet them.

Elsewhere, *Discovery* is in the Bay 2 processing hangar being prepared for an early September launch on STS-64 carrying the Lidar In Space Technology Experiment-1. Work this week included installing tires on the main landing gear, inspections of the reaction control system thrusters, tests of the APUs, opening of the payload bay doors and checks of the main propulsion system.

Recently arrived via 747 carrier from California, *Atlantis* has been powered up in the bay 3 processing hangar where it is being readied for what will be its first flight in two years, STS-66 in late October with the third Atmospheric Lab for Applications and Sciences.

Other work on *Atlantis* this week included opening the cargo bay doors, functional checks of the reaction control system steering thrusters, removal of the ferry flight orbital maneuvering system pods and tests of the water spray boilers.

'Smallsat' contracts signal new opportunities

NASA's "faster, better, cheaper" policy moved forward earlier this month with Administrator Daniel Goldin awarding two "Smallsat" satellite contracts to TRW, Inc. and CTA.

The new "Smallsat" satellites will observe the Earth with unprecedented sensor technology.

Goldin awarded contracts to California-based TRW, Inc. and Maryland's CTA following an indus-

try-led competition to build, launch and operate the satellites — each no bigger than a console television set — for less than \$60 million each. The satellites are to be developed, launched and delivered to orbit in 24 months or less on a Pegasus launch vehicle.

"This is a new way of doing business for NASA," Goldin said. "We told industry what to do — not how to do it. If the satellites don't perform,

they don't get their performance fees. If they run into cost overruns, they'll face a dollar-for-dollar reduction in their fees."

The Smallsat program will help open new commercial opportunities for American industry and contribute significantly to the science goals of NASA's Mission to Planet Earth and several other science programs.

Please see **SMALL**, Page 4.

HST unveils evidence of planet forming process in the Milky Way

The Hubble Space Telescope has uncovered strong evidence that the process that may form planets is common in the Milky Way galaxy and the universe beyond.

At a Monday press conference, astronomer Robert O'Dell said observations with the newly repaired telescope clearly reveal that great disks of dust — the raw material for planet formation — are swirling around at least half and probably many more of the stars in the Orion Nebula, a region only 1,500 light years from Earth where new stars are being

formed.

O'Dell, a Rice University astronomer and a colleague, Zheng Wen, formerly of Rice and now at the University of Kentucky, surveyed 110 stars and found disks around 56 of them.

"Since it is easier to detect the star than the disk, it is likely that far more stars are being orbited by protoplanetary material," O'Dell said.

O'Dell first discovered these disks, which he dubbed "proplyds," in HST images taken in 1992. However, the new images bolster his theory by dis-

tinguishing clearly that the objects are indeed pancake-shaped disks of dust, not shells of dust as some astronomers have maintained.

HST clearly resolves a young star at the center of each disk. O'Dell also has been able to measure at least a portion of the mass of a dust disk and found that the disk contains enough material to make an Earth-like planet.

The theory that the Earth and other planets of the solar system were formed out of just such a disk some 4.5 billion years ago by the coalescing of matter caused by gravitational

attraction is widely accepted. O'Dell said the disks in the Orion Nebula presumably contain the same materials that constitute the planets of Earth's solar system, carbon, silicates and other base constituents.

The only confirmed planetary system to date consists of three Earth-sized bodies orbiting a neutron star 1,000 light-years away. Since the neutron star is the burned-out remnant from a stellar explosion, these planets might have formed at the end of the star's life, and so, are not a good indicator of the abundance of

planetary systems like our own.

O'Dell's findings of an abundance of protoplanetary disks in a cluster of young stars reinforces the assumption that planetary systems are common in the universe.

Since planets are necessary for life as it is known on Earth to become established and flourish, the likelihood that planets are common in the universe raises the likelihood of the existence of life beyond Earth.

The only place where life is known

Please see **HUBBLE**, Page 4.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For information, call x35350 or x30990.

Astros Games: Tickets available for the Astros vs. Cubs game at 1:35 p.m. July 3. Cost is \$14 for field level seating. Tickets are on sale through today.

Country Western Dance: Tickets available for dinner dance from 7:30 p.m.-midnight June 25. Cost is \$15 person and includes barbecue dinner and entertainment. Tickets are on sale until June 22.

Casino Trip: Tickets available for New Orleans Casino trip, July 9 & 10. Cost is \$125 and includes transportation, some meals, hotel accommodations and admission to Queen of New Orleans Casino Boat.

Sleeping Beauty: Tickets available for June 24 performance of Sleeping Beauty by Friendswood Ballet at the Grand Opera House in Galveston. Cost is \$21 for special seating and \$8.40 for general seating.

Six Flags: Tickets available for one-day weekend and weekday admission. Cost is \$20.95 for weekend and \$16.75 for weekday. Two-day admission, either weekend or weekday, is \$27.25.

Seaworld of Texas: Discount tickets: adult \$20.95; child (3-11), \$14.25.

Fiesta Texas: Discount tickets: adult \$18.95; child (4-11) and seniors (55+), \$14.25.

Splash Town: Discount tickets, \$11.05.

Waterworld: Discount tickets, \$10.50.

Astroworld: Discount tickets: adult \$19.95; children under 54 inches tall, \$17.75.

Moody Gardens: Discount tickets for two of three different attractions: \$9.50

Space Center Houston: Discount tickets: adult, \$8.75; child (3-11), \$4.75; commemorative, \$9.55.

Metro tickets: Passes, books and single tickets available.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Loew's Theater, \$4.50.

Stamps: Book of 20, \$5.80

JSC history: Suddenly, Tomorrow Came: A History of the Johnson Space Center, \$11.

JSC

Gilruth Center News

EAA badges: Dependents and spouses may apply for photo identification badges from a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Weight safety: Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. June 28. Pre-registration is required. Cost is \$5.

Defensive driving: Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is July 9. Cost is \$19.

Aerobics: High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido: Martial arts class meets from 5-7:30 p.m. Tuesdays and 6:15-8:15 p.m. Wednesdays. Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month. New classes begin the first of each month.

Country Dancing: Classes meet Mondays. Beginners class meets from 7-9 p.m.; advanced class meets from 8:30-10 p.m. Partners are required. For additional information, contact the Gilruth Center at x33345.

Softball Tournament: "Fun in the Sun" softball tournament will be held June 25-26. Cost to enter is \$100. Registration deadline is June 22. For additional information, call x33345.

Sailing Club: Sailing lessons are planned for May and June. For information, contact Richard Hoover at x31360 or 996-7716.

Golf lessons: Lessons for all levels. Cost is \$90 for six weeks. For additional information, contact x33345.

Fitness program: Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: Bay Forest 4-2-2, marble formal DR, tile kitchen/laundry/morning room, sec sys, fans, Pam, x33761 or 488-6227.

Sale: Oakbrook West, 4-2-2, completely updated, reduced to \$94.5k. Denise, x31846 or 486-5146.

Sale: Meadowbend, 3-2-2, approx 1600 sq ft, no approval, assum 8% FHA, \$69.9k. 334-1072.

Sale: Lake Livingston lot, 30'x70', 1/2 mi from water, paved roads, utilities avail, \$3k negotiable. Walt, 422-6369.

Sale: Friendswood, 4-2-5-2+, 2137 sq ft, lg living area, FPL, Jacuzzi, formal DR, fans, sec sys, 2 yrs old, cul-de-sac, \$105.9k. 992-1466.

Lease: Clear Lake condo, 2-1, cov parking, gym, pool, sec, tennis, \$650/mo incl util. 480-5583 or 482-7156.

Sale/Lease: Baywind II condo, FPL, W/D hookup, new carpet, paint, hardware, \$26.9k or \$425/mo. 333-4144 or 333-4114.

Lease: Friendswood Forest Bend, 3-2-2, both formals, den w/FPL, 1800 sq ft, no pets, \$650/mo + sec dep. Sally, x33948 or 488-5501.

Rent: Heritage Park, 3-2-2, 1700 sq ft, \$800/mo + dep. Sonny, x38533 or 474-4198.

Sale/Lease: 3-2-3, formals, lg den, lg garage, new roof, A/C, appli, \$69.9k or \$750/mo. Gary, x31059 or 480-9716.

Lease: University Green, TH, 3-2.5, garage, FPL, fans, near JSC, \$850/mo. 334-2198.

Sale/Lease: League City historical district, 2-1 frame, lg lot, lg trees, 10' ceilings, fans, \$59.5k or \$575/mo. 338020 or 334-1505.

Sale: Ft. Lauderdale, FL, luxurious condo, time share, 300' from Atlantic, incl world wide accom, yacht and tennis club, \$10k. 334-3998.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Sale: Galveston beach house, 3-2, CA/H, furnished, new carpet, 300' from beach. Ed Shumilak, x37686 or 326-4795.

Lease: One BR condo, W/D, FPL, sec alarm, appli, cov parking, new carpet, tennis, upstairs. Jim Briley, 244-4632 or 488-7901.

Rent: Furn Colorado home, sleeps 6, close to fishing/other summer activities, no smoking/pets, day/wk/mo or longer, Bob, x30825 or 998-7372.

Cars & Trucks

'81 Olds Cutlass Supreme, V6, auto, A/C, recl buckets, AM/FM/cass, 114k mi, clean, \$1875. x30246 or 480-5583.

'84 Chevy S-10 Blazer, ex cond, blue w/blue int, mag wheels, cass player w/equalizer, auto, A/C, \$3.5k nego. 472-8549.

'86 Nova, 4 dr, sunroof, AM/FM/cass, 5 spd, manual trans, good cond, no A/C, \$900/OBO. Dave, x45381.

'80 Buick Regal, V6, 2 dr, new battery and alternator, good tires, 89.5k mi. \$850. x31423.

'82 Chevrolet Caprice, runs good, \$600. x45826 or 486-2022.

'90 Pontiac Sunbird LE, 2 dr coupe, red ext, gray int, 5 spd, A/C, tilt, stereo tape, ex cond, new tires, \$3700. 341-9222.

'89 VW Fox GL Sport, 4 dr, 5 spd, A/C, stereo tape, 66k mi, red ext, gray/blk int, ex cond, \$3500. 341-9222.

'91 Dodge Caravan, 7 pass, V6, A/C, air bag, cruise, AM/FM/cass, pearl blue ext, 30k mi, ex cond, \$9.9k. x33748 or 996-1408.

'88 Honda CRX Si, red, 5 spd, tint, A/C, P/S, tilt, sunroof, stereo, alarm, sport tires, 49.6k mi, \$6k. John, x39007.

'92 T-Bird LX, 5.0L V8, loaded, garaged, warranty, 19k mi, \$13,550. 282-3784.

'93 Toyota MR2, 14k mi, 5 spd, AM/FM/cass/CD, pwr windows, after market leather, \$16.5k. 334-4301.

'78 Chevy Blazer, brown & white, 350 V8, new battery, tires, AM/FM/cass, garaged, well maintained, A/C, ex cond, \$2.3k. Ed, 481-4889.

'85 Cadillac Sedan Deville, loaded, clean, one owner, 88k mi, \$4.6k. x34132 or 486-5331.

Super T10 4-spd '80 Vette trans, fine spline, fits most GM, ex cond, \$250 OBO. 488-5546.

'86 Four Winns 170 Horizon Bowrider, 17', 170 Mercuriser, galv Sportsman trlr, extras, \$6,950. x37010 or 334-2612.

'16' Hobie Cat w/trlr, yellow sails, beach tires, life jackets etc incl, \$950 OBO. x41081.

'18' Hobie Cat sailboat w/trlr, \$1.8k OBO. Bill, x47270 or 486-8871.

Sunfish sailboat, ex cond, multicolored sail, custom cover, galv trlr, \$1.2k. x39147.

Chrysler 22' sailboat, sleeps 6, galley, head, fixed keel, 5hp O/B, mainsail, 2 jibs, ex cond, slip in Clear Lake, \$2.5k. 282-1727.

'81 Kawasaki 750 LTD, ex cond, \$1.7k. Beeper 891-9364.

Audiovisual & Computers

Original Apple IIe, Apple dual disk drive, monitor and dot matrix printer, \$100 OBO. Allen, x30791 or 326-4720.

Pioneer CS-88 stereo speakers, \$100 pair, x36813.

IBM S/W: Ultima 7, \$10; and on CD ROM, Return to Zork, \$25; Gabriel Knight, \$25; and Battle Chess, \$15. Chad, x35786 or 482-9263.

Denon rcvr, 40 watt, all audio/video inputs, professional quality, ex cond, \$125. Don, 282-6811 or 532-1361.

Sherwood tuner, amp and KLH speakers, \$50. Charlie, x34647 or 488-4412.

No. 73 computer brain for '86/'87 Nissan Maxima, \$100. Anne, x48169 or 426-6392.

JSC

Dates & Data

Today

Juneteenth picnic — The JSC African American Council Cultural Committee will present its annual Juneteenth picnic and Ron McNair Scholarship fundraiser from 3-9 p.m. June 17 at the Gilruth Center.

Cafeteria menu — Special: fried chicken. Total Health: vegetable lasagna. Entrees: broiled cod fish, beef stroganoff, vegetable lasagna. Vegetables: steamed broccoli, carrots vichy, Italian zucchini, breaded okra.

Monday

Cafeteria menu — Special: meat sauce and spaghetti. Total Health: potato baked chicken breast. Entrees: wieners and sauerkraut, sweet and sour pork chop, potato baked chicken, steamed fish, French dip sandwich. Soup: cream of asparagus. Vegetables: French cut green beans, seasoned rice, California vegetables, buttered beans.

Tuesday

Blood drive — Barrios Technology will host a blood drive from 8-11:30 a.m. June 21 at 1331 Gemini. For an appointment, call Tom Hanson, 244-7473.

Cafeteria menu — Special: smothered steak with dressing. Total Health: shrimp creole over rice. Entrees: beef stew, liver and onions, shrimp Creole, baked chicken, French dip sandwich. Soup: navy bean. Vegetables: steamed rice, seasoned cabbage, corn O'Brien, peas, potatoes au gratin.

Wednesday

AFCEA meets — The Houston Space Chapter of the Armed Forces Communications and Electronics Association will meet from 11:30 a.m.-1 p.m. June 22 in the Ballroom

of the Holiday Inn on NASA Road 1. John O'Neill, director of Mission Operations will discuss the "Operations and Future of JSC." Cost to attend is \$12 for members and \$14 for nonmembers. For reservations, contact Linda Giannukos, 282-7531 by June 20.

JAS meets — The JSC Astronomy Seminar will meet at noon June 22 in Bldg. 31, Rm. 129. D. Scharmm will present a videotape on "Solar Neutrinos." For additional information, contact Al Jackson, 333-7679.

Cafeteria menu — Special: salmon croquette. Total Health: vegetable plate. Entrees: roast pork, baked perch, steamed fish, vegetable lasagna, Reuben sandwich. Soup: seafood gumbo. Vegetables: mustard greens, okra and tomatoes, vegetable sticks, lima beans.

Thursday

Cafeteria menu — Special: stuffed cabbage rolls. Total Health: oven crisp cod. Entrees: beef tacos, ham and lima beans, pork and beef egg rolls, steamed fish, French dip sandwich. Soup: beef and barley. Vegetables: Brussels sprouts, green beans, buttered squash, pinto beans.

Friday

Cafeteria menu — Special: baked chicken. Total Health: roast beef au jus. Entrees: deviled crab, Creole baked cod, baked chicken, beef cannelloni, Reuben sandwich. Soup: seafood gumbo. Vegetables: seasoned carrots, peas, breaded okra, steamed cauliflower.

June 25

Western Dance — The EAA Country Western Dance will be held from 7:30 p.m.-midnight in the Gilruth Center. Cost is \$15 per person and

includes entertainment and barbecue dinner. Last day to purchase tickets is June 22.

June 29

JAS meets — The JSC Astronomy Seminar will meet at noon June 29 in Bldg. 31, Rm. 129. For additional information, contact Al Jackson, 333-7679.

July 4

Independence Day — Most JSC offices will be closed in observance of the Independence Day Holiday.

July 13

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. July 13 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x30390.

July 21

Apollo anniversary — A 25th anniversary splashdown party is planned from 4:30-7:30 p.m. July 21 at the Gilruth Center. Cost is \$3 per person. Tickets may be purchased at the Bldg. 11 Exchange Store through July 15. Requests for specially designated reunion areas should be made to x34322.

August 10

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. Aug. 10 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x30390.

Sept. 5

Labor Day — Most JSC offices will be closed in observance of the Labor Day Holiday.

992-4132.

White metal tubular bunk bed; full sz bottom, twin sz top, \$300 OBO; 3 pc white BR set, \$150 OBO; sparkling water carbonation machine, \$50 OBO; upright vacuum w/attach, \$40 OBO. Tony, x47401 or 482-4156.

Wanted

Want twin sz bookcase headboard, maple finish. 480-3424.

Want female Doberman puppy. Fran, 333-6277 or 339-3562.

Want nonsmoking female roommate to share Middlebrook, LC 3-2-5-2, \$350/mo + 1/3 util, no pets. x31891.

Want male, nonsmoking roommate to share CLC 3-2-2, \$425/mo, all bills paid incl cable, excluding long distance. Jim, 486-2463.

Want responsible m/f roommate to share 4-2-2, nonsmoker, \$295/mo + 1/3 util. Karen, x37389 or 992-3783.

Want roommate, nonsmoker, to live in Friendswood 4-2, W/D, cable, VCR, microwave, gas grill, all household privileges, \$250/mo, all bills paid. Michael, x38169 or 482-8496.

Want nonsmoking roommate to share LC 3-2-2, \$250/mo or \$325 for private bath + 1/2 util. Rob, x41027 or 538-1449.

Want roommate to share new house in Kemah, male, nonsmoker preferred, \$350/mo + 1/2 util. Jeri, 333-7552.

Want roommate, m/f, Baybrook condos off Eldorado, \$300/mo all bills paid, incl cable. Greg, 286-6036.

Want female roommate to share 3 BR house in the Landing, LC, \$275/mo + 1/2 util. Cathy, x41267 or 554-4579.

Want considerate, responsible, nonsmoking housemate to share 3-2-2 in Bay Glen, CLC, \$300/mo + \$200 dep and 1/2 util. Larry, x33168 or 488-4760.

Want to trade 2 Phantom of the Opera tickets, 8 pm 6/25 for other performance. Steve, x36613 or 488-7610.

Want NASA publications SP4203 *On the Shoulders of Titans (Gemini)* or any other SP publications. Ron, 333-6952 or 482-1385.

Want personnel to join VPSI vanpool, West Loop park & ride lot at 6:55 am to NASA/contractors. Richard Heetderks, x37557 or Ed Rangel, x36124.

Miscellaneous

Vitamaster 900 deluxe stair stepper w/floor mat, ex cond, was \$1.5k, now \$700. x36043 or 484-2965.

Steel screen security screen door, fits outside standard 36"x80" front door, double locks w/deadbolt, \$25. Mike, 484-0987.

Pres and First Lady Gold Charter membership, all inclusive, \$250 OBO. Allen, x30791 or 326-4720.

Miller TIG welder, high freq, 220 volt, argon tank incl, \$1k. Phil, 212-1339 or 337-6614.

Versaclimber stairstepper and upper body exerciser, professional quality, \$325. Don, x36921 or 486-1830.

Jenny Lind crib and mattress, changing table and pad, rocking chair, \$100; wood youth bed and mattress, \$15. x31543.

Once used wardrobe and packing boxes, \$1

to \$2 ea. Will, x31971.

PRO-3000 programmable stairstepper, \$400. x39034 or 474-2660.

Bridal slip, sz 6, zipper up back, semi-full skirt, \$30. Jennifer, x32417.

22-LR Jennings semi-auto pistol w/box and extra clip, \$55; 110 lb weight set, \$10; spring chest exerciser, \$5; professional quality dbl action air sander/polisher, \$30. Terry, 474-5639 or 698-9875.

Two tickets Eagles, July 2, Rice Stadium, were \$50 ea, now \$80 both. Carol, x35124.

Evenflo infant car seat, \$20; Fisher Price nighttime bottle cooler/warmer, \$20; Crib Cuddle II w/cuddle heart, \$35; boy's blue baptism outfit, newborn sz, \$25; boy's white baptism outfit, sz 6 mo, \$15. x45035.

Two Pres and First Lady Charter Gold memberships, \$400 ea, 6.30 mo dues. Sandy, x49875 or 489-4843.

Medium sz desk, \$90. Faye, 470-1455.

'70 Apollo Moon Flight globe, ex cond, ID's Apollo sites throughout A-19 and crews, \$18. Gary, x31059 or 480-9716.

Oceanic aquarium, 60 gal, pump, filter, light, \$200 neto. Ted, x36844 or 335-1930.

Herringbone necklace, 14k gold, 20" long, 5.8mm wide, was \$373, now \$224. Eric, x31917.

Porch swing, 4' w/chain, \$25. Eric, x31917.

Accusnet golf clubs, irons and woods, bag, \$80. Mike, x33056 or 554-2233.

Powerset, \$15; VTVM, \$18; Stout 5V plus 12V and minus 12V pwr supply, \$35; matches set of tires, P235-75R15, good cond, \$100. Tom, 996-5835.

Cymbidium orchids, 3 lg pots, \$10 ea. John, x30446 or 338-2625.

Schwinn Aireadyne, ex cond, \$325; Honda lawnmower, used 2 seasons, \$300; water distiller, \$65; '77 Encyclopedia Britannica, complete. leather bound, w/yearbooks, \$75. Don, x32594 or 480-4444.

Riding lawnmower, 11hp, 30" deck, 8 spd, ex cond, \$450. Mark, x38013 or 992-4132.

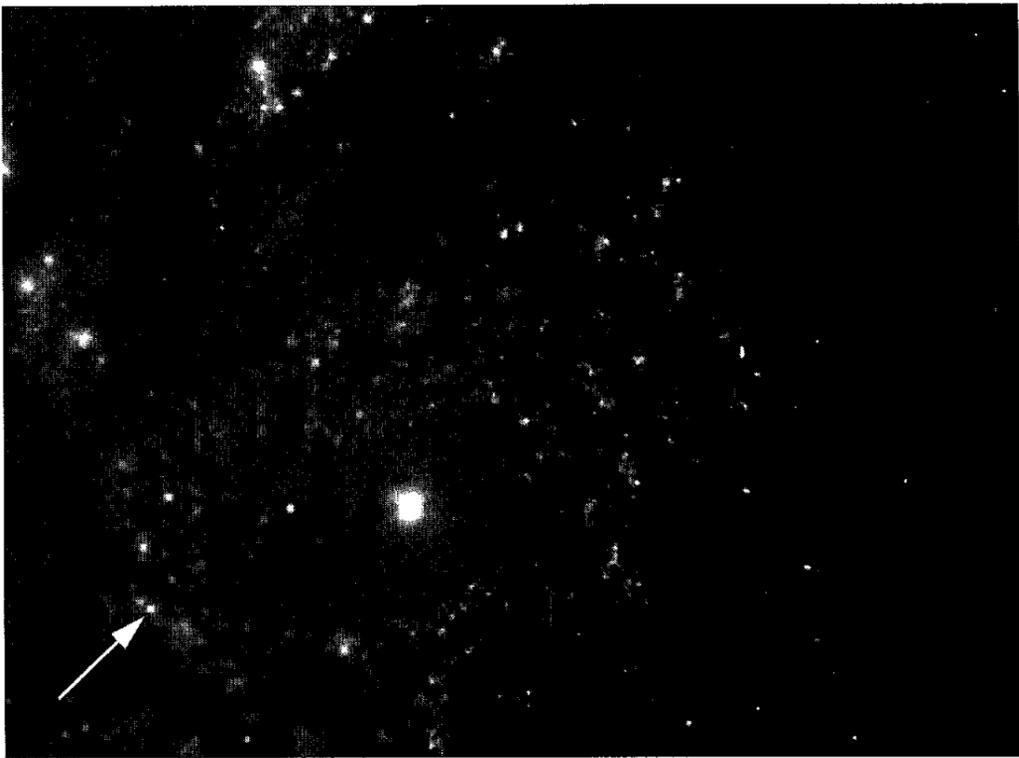
Three-pc sectional sofa, cream, matching coffee table, \$650; Panasonic 700 watt microwave, \$75. 334-3998.

Bridal veil, new, white, sequined headband w/pearls, \$90. 334-3998.

New Wards vertical blinds, 3.5" fabric w/valances, 78"Wx84"L, peach, teal, white, HW incl, were \$125+, now \$40 ea. Ed, 481-4889.

Six-drawer dresser/mirror; floor polisher; 13" B&W TV; TI99-4

NASA probes explore cosmos



By Eileen Hawley

NASA's science projects continue to probe the universe providing information about the mysteries and wonders of our universe, its history and its possible future.

Just six months after the servicing of the Hubble Space Telescope, recent discoveries about the universe made using the telescope were, not surprisingly, the main topic of discussion at the summer meeting of the American Astronomical Society held in Minneapolis earlier this month. Participating in those discussions was shuttle astronaut and astronomer, Jeff Hoffman.

Hoffman was invited to discuss his activities as a crew member during the STS-61 mission to service the Hubble Space Telescope last December. Hoffman presented "The View from the Crew," an in-depth technical look at the upgrades and modifications made to the telescope.

"It was really unique presenting to a group of astronomers," Hoffman said. "I could concentrate on the technical details of the mission and there was very active questioning about how could we improve the design for future astronomical missions."

According to Hoffman, the planned addition of two major new instruments to the telescope during the next servicing visit has the astronomical community excited. One of those instruments will provide the telescope with an infrared capability.

"The formation of new stars often involves a lot of relatively cool gas and dust which doesn't emit a lot of light, but does emit large amounts of infrared," Hoffman said. "And most exciting, I think it's probably the key to finding other planetary systems." Hoffman believes the main object of interest for astronomy in the next decade will be the search for other planets, including "how many Earth-like planets there may be in the galaxy."

Hoffman enjoyed the cooperative feeling he found between the astronomical community and the human space flight community during his discussions with seminar participants. The quality of information being provided from Hubble and other NASA science probes is allowing these historically opposed communities to join together. Hoffman reported that many conference attendees personally extended their thanks and congratulations to him and to NASA for the excellent work done on the telescope.

"One speaker finished her talk and came over to me later," Hoffman said. "She wanted me to thank everyone at NASA for making her speech possible."

Chief among the topics of discussion at the

technical meeting was the confirmation of a black hole located in galaxy M87 located about 50 million light years from the Earth. A black hole is an object so massive yet so compact that nothing can escape its gravitational pull, not even light.

"Clearly the black hole was there, it was beckoning," Hoffman said. "We had indications even before the repair mission where we saw this accretion disk of the black hole." According to Hoffman, astronomers knew that if they could somehow get a sharper image of the activity in the central region of M87, get a good visual picture and then use the spectrometers to measure the velocity of the gas to determine the mass of the system, it might provide conclusive proof of the black hole.

Researchers Holland Ford of the Space Telescope Institute and Johns Hopkins University and Richard Harms of Applied Research Corp. used HST's faint object spectrograph to measure the speeds of orbiting gas on either side of the dark gaseous disk in the hopes of confirming previous hypotheses.

"And sure enough that's what the telescope did, and sure enough it worked and sure enough it was a black hole," Hoffman said.

HST was the only instrument that could have confirmed the existence of the black hole, Hoffman said. Although there are some instruments on the ground that use very sophisticated active optical technology, no Earth-based telescope could duplicate Hubble's performance in photographing and measuring the gaseous disk in the center of M87.

The black hole was not the only investigation under discussion at the meeting. Observing star burst regions — regions in our galaxy or nearby galaxies where new stars are formed — is another active area of investigation.

"This is just what people had dreamed of," Hoffman said. "We can look at lots of stars close together with incredible resolution." Researchers are learning about the formation processes of stars using the improved resolution capabilities of the telescope.

Less is known yet about galaxy formation, since those are longer-term investigations. But Hoffman reports the community is getting a tremendous number of pictures of far away galaxies.

"One of the observing programs is to look into regions of the sky where we don't know what's there," Hoffman said. "We are trying to see as far away and as early in the history of the universe as we can to see if we can perceive a difference in the way galaxies looked then and they way they look now."

Hoffman categorizes the results now being seen from the refurbished telescope as a "trickle that's going to turn into a downpour in the next couple of years."

In the coming weeks, the main observing goal of most astronomers and scientists will be the anticipated collision of the Comet-Shoemaker-9 comet into the surface of Jupiter. The cometary fragments will begin crashing into Jupiter about July 16 and continue through July 22.

Hubble, along with most ground-based telescopes, will turn its eye toward Jupiter in an attempt to document the aftermath of the impact. The impact will occur on the side of planet that is turned away from the Earth. That means the telescopes with the best chance to view the impact are the Galileo and Voyager spacecraft.

Because of Voyager's distance from the planet, Jupiter will appear as a point of light, but according

to Hoffman "if there's a big flash of light from the impact, it still will be able to record that." Galileo, suffering from a loss of continuous coverage capability due to antenna problems, will be turned toward the planet and programmed to begin image-taking at the anticipated time of the collision. If the plan works, Galileo will have the best view of the impact. But what exactly will the orbiting telescope and NASA spacecraft see?

"We think this explosion will produce ripples in the atmosphere much like when you throw a pebble on a pond," Hoffman said. "So, as Jupiter turns and the region of impact comes into the view of Earth there will be some

remnants of the collision." It is those ripple remnants that HST and other ground-based telescopes will be able to see. Faith Vilas, planetary astronomer in JSC's Solar Systems Exploration Division plans to be in Diego Garcia using a high-resolution telescope to observe the after-effects of the impact.

According to Hoffman, the astronomical community stands to learn more about Jupiter than comets by observing this collision since the comet string will disappear beneath the giant planet's cloud layer. By measuring the energy and the shock waves coming out from the impact, researchers may gain valuable information about the atmosphere of Jupiter.

"It's almost like being able to do a laboratory experiment on the planet's atmosphere," Hoffman said.

The Ulysses spacecraft, continuing its voyage toward the Sun, also will be in a position to measure radio emissions that ripple outward from the series of impacts caused by the collision.

Ulysses will have a view of the limb, at 74.5 degrees south of the sun's equator, and will be able to make measurements of radio and plasma waves radiating through space as the fragments collide.

The Ulysses spacecraft, on its way to explore the polar regions of the sun, is traveling through areas of space never before visited. In this region well below the sun's magnetic equator, the spacecraft has encountered a more tranquil zone where magnetic interference is at a minimum and the solar wind originating from the sun is speeding at double the expected rate — about 2 million miles per hour.

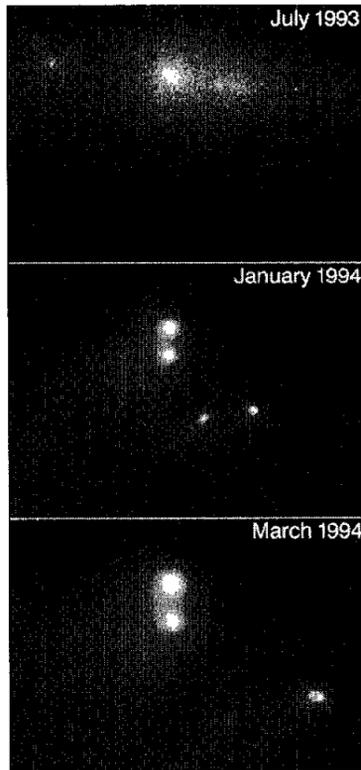
This change in speed coincided with the spacecraft's passage above a sheet of electrical current that separates the solar wind originating in the northern hemisphere from that originating in the southern solar hemisphere.

Traveling at a heliocentric velocity of about 41,000 miles per hour, Ulysses will descend to 70 degrees south latitude on June 26, marking the beginning of a four-month pass over the sun's southern pole.

The Galileo probe continues its 2.4 billion mile journey to Jupiter. In August 1993, Galileo provided the first images of asteroid Ida and its orbiting moon.

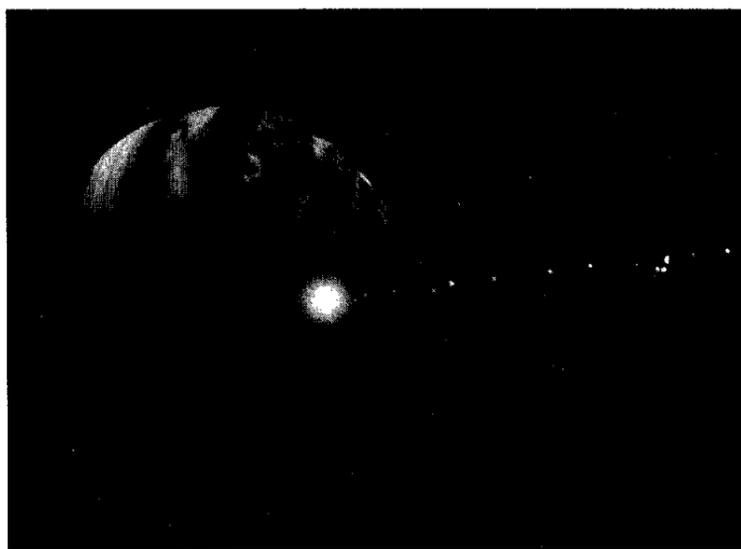
Once Galileo arrives at Jupiter, the spacecraft will use an instrumented probe to explore the atmosphere surrounding the giant planet. Following that investigation, the spacecraft is expected to enter an orbit around the planet in December, 1995.

JSC and other NASA scientists continue to further the cause of planetary exploration with a variety of proposals and small programs designed to increase our understanding of the universe. □



NASA photos

Top: This Hubble Space Telescope image of a supernova in Galaxy M51 shows the galaxy's spiral disk which extends to the nucleus; **Center:** A series of images shows the evolution of the brightest region in Comet Shoemaker-Levy 9; **Left and Right:** Artist's representation shows the comet as it approaches its July collision with the giant planet, Jupiter.



Secretaries cited for accomplishments

Wood receives Bocking Award

Bobbie Wood of the Human Resources Division recently was awarded the Marilyn J. Bocking Award for Secretarial Excellence.

Wood received the award in April in recognition of her efforts to make the organization "more responsive and less frantic." The citation further recognized Woods' efforts toward continuous process improvement, her ability to handle customer inquiries, and her willingness to mentor junior employees.

Woods' ability to help her coworkers build their self confidence was considered "particularly noteworthy" by her management.

Health fair offers tips on avoiding injury

JSC's Total Health Program will be offering suggestions on how to keep job stress from becoming a pain in the neck, or wrist, or back at its Ergonomics Fair Thursday in the Gilruth Center.

"There are a lot of simple changes people can make in their work environments to keep themselves healthy," said Greta Ayers, assistant director of health fitness. "The Ergonomics Fair can help to educate employees on how to design their work stations or work habits to minimize the chance of injury."

Ergonomics deals with the relationship between people and the tools they use to do their jobs. Simple ergonomic designs can help workers be more productive, experience less stress and increase worker comfort and satisfaction on the job.

The JSC Total Health Program will host the fair from 9 a.m.-3 p.m. in the Gilruth Center. The fair will feature a number of booths offering information about ergonomic equipment

for office and industrial work areas, as well as a variety of seminars on ways to avoid ergonomic injuries. The information booths will be located in the ballroom and will include representatives from JSC's Total Health Program, the JSC Clinic, Environmental Health Services, the JSC Physical Fitness Program, Voluntary Protection Programs, the JSC Safety Learning Center, and Hand Surgery Centers of Texas.

The seminars will be held in Rm. 204 at the Gilruth Center beginning at 10 a.m. with a presentation on "Industrial Ergonomics" by Jacqueline Armstrong of Webb-Murray & Associates. Dr. Louis Clarke will discuss "Musculoskeletal Disorders in the Workplace" at 11 a.m. and Dr. Michael Brown of the Hand Surgery Centers of Texas will follow with a discussion of "Endoscopic Carpal Tunnel Release/Advancements Enhances Surgery" at 1 p.m. The final session of the day will begin at 2 p.m. with Dan Clem of the JSC Safety Office presenting "Protect Your Back - Back Care and Proper Lifting."

Also at the fair, free computer wrist pads and ErgoExercise software will be available while supplies last, and there will be a drawing for other prizes. For additional information on the Ergonomics Fair, contact ext. 36475.

Space News Roundup

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JSC

People

LeBlanc wins secretarial honor

Patricia LeBlanc, a secretary in the Engineering Directorate, recently was awarded the Marilyn J. Bocking Award for Secretarial Excellence.

According to the award nomination, LeBlanc's performance "exemplifies secretarial excellence." She was acknowledged for her dedication and willingness to support the activities of the Engineering Directorate.

The award citation also recognized LeBlanc's "excellent rapport with Division managers which contributes significantly to the effectiveness" of directorate operations.

Honor presented to McMinimy

Norma McMinimy, secretary for Mission Operations program support, recently received the Marilyn J. Bocking Award for Secretarial Excellence.

McMinimy was honored for her "outstanding performance" supporting the office as well as for her willingness to assume additional responsibilities as a member of the division's total quality task force.

The award nomination cited



Wood

LeBlanc

McMinimy

Weisskopf

McMinimy's "ability to organize complex tasks, work effectively with others, and commit time and effort to serve others."

Recognition goes to Weisskopf

Kathleen Weisskopf, secretary to the Vehicle AIT Manager, recently was honored by the Space Station Program Office for her dedication to the program.

Weisskopf received the award in recognition of the "long hours" spent in support of program office-level activities. Weisskopf has assisted in preparing material for presentation to the NASA Administrator and to congressional committees.

According to the award citation, Weisskopf received the honor because she "remained pleasant and efficient" while working on "intense, short-fuse items."

Hubble images provide new clues to universe

(Continued from Page 1)

to exist is Earth. Finding life, or fossils of life, elsewhere in our solar system — the major object of the exploration of Mars — would be the first evidence of life beyond our home planet. For life to arise independently on two planets in the same solar system would mean that life likely is not accidental and is abundant in the universe.

The HST images clearly distinguish the central star from the disk and show that stars in Orion that are the mass of our Sun and lower are likely to possess disks. Stars hotter than our Sun might destroy the dusty disks before they can agglomerate into planets, according to O'Dell.

HST can see the disks because they are illuminated by the hottest stars in the Orion Nebula, and some of them are seen in silhouette against the bright nebula. However, some of these protoplanets are bright enough to have been seen previously by ground-based optical and radio telescopes as stars.

Their true nature was not recognized until the HST observations.

One HST image shows a dark elliptical disk silhouetted against the bright background of the Orion nebula.

"This object represents the most direct evidence uncovered to date for protoplanetary disks," O'Dell said. Hubble's resolution has allowed

O'Dell to determine accurately the mass of the outer rim of the disk at several times the mass of our Earth. The entire disk is 53 billion miles across, or 7.5 times the diameter of our solar system. The central, reddish star is about one fifth the mass of our Sun.

The disks identified in the HST survey are a missing link in the understanding of how planets like those in our planetary system form. Their abundance in a young star cluster shows that the basic material of planets exists around a large fraction of stars. This reinforces the probability that many stars have planetary systems.

Event to honor global heritage

The Office of Equal Opportunity Programs is planning an American Heritage Day for all JSC employees.

"This will be a day to celebrate the diverse heritage of the entire JSC workforce," said Equal Opportunity Program Deputy Director Estella Gillette. "We want to include the entire JSC family in this celebration of the unique mixture of cultures that we call 'American.'"

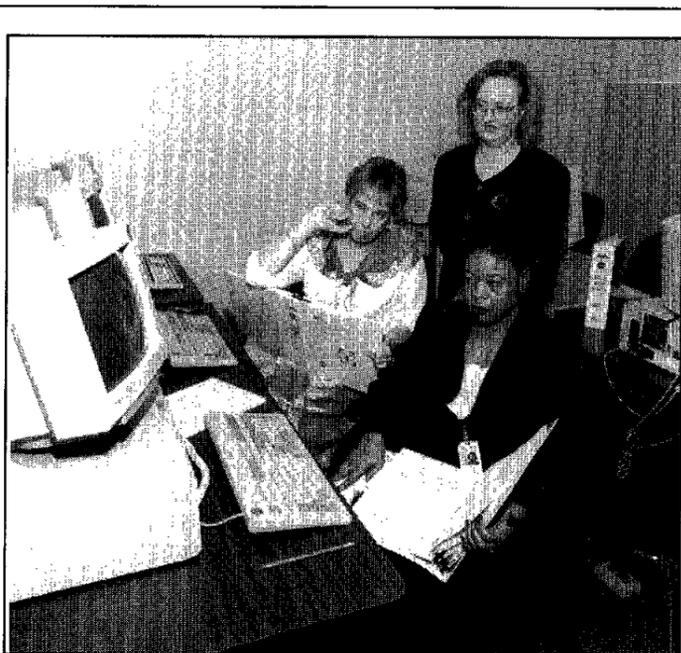
American Heritage Day is set for July 8 and will acknowledge both the Independence Day Holiday and the 30th anniversary of the passage of the Civil Rights Act. Activities are still in

the early planning stages.

To help the planning committee properly acknowledge the diverse cultures represented at JSC, organizers are asking employees for assistance.

"We would like to honor everyone's heritage at this event," Gillette said. "So we are asking employees to tell us the country of their ancestry." To help, employees can fill out the form at the end of this article and return it to the EO office.

Additional details on American Heritage Day will be provided through the Space News Roundup as they become available.



Participating in a software review of the electronic Time, Attendance and Labor Collection/Labor Distribution system are Jessie Hendrick, standing, Barbara Shock, rear, and Bennie Williams. The three were part of a User Group Orientation held in the newly-established Systems Training Facility in Bldg. T-585.

Attendance records computerized

Beginning in Spring 1995, the JSC employees tasked with processing the center's Time and Attendance card and Labor Distribution Records will no longer find themselves buried under mounds of paperwork every two weeks.

A new electronic Time, Attendance and Labor Collection system will be implemented to replace the current paper-intensive system. Training in how to use the new system will be conducted in the new systems training classroom located in Rm. 129, Bldg. T-585.

The classroom can support up to 18 students and is equipped

with workstations linked to the Center Information Network. More than 800 JSC employees will be trained on the new system. The classroom also will host training for the NASA Accounting and Financial Information System program currently in development. A new labor distribution system for accounting and reporting will be implemented with NAFIS. NAFIS should be implemented agency-wide in 1996.

For additional information regarding use of the systems training facility, contact Nancy Porter at x34011.

Small satellites to contribute to NASA's science program

(Continued from Page 1)

The entire contract process — from final announcement to contract signing — was completed in 70 days, instead of 6 months to a year.

"From the beginning, industry has involved minority-owned businesses and small businesses with leading roles in this critical, high-technology enterprise," Goldin said. "This is a bold new way to do business that draws on women, minorities, students and teachers to create a richer process from the start."

"We'll be putting a new class of satellites into the sky, with unprecedented ability to scan both the countryside and the city landscape on a global scale for scientific and commercial purposes."

TRW's \$59 million satellite will be the first-ever "hyper-spectral" imaging system, using a sensor with 384 separate spectral bands and cloud editing capability.

The system will have wide applications in the Earth science activities and new commercial business opportunities in forestry, agriculture, water and land-use management, and environmental monitoring.

"The satellite is designed to tell us

whether it's looking at a sugar maple or an elm — and whether the tree is diseased or healthy. It will tell farmers when pests are invading their crops, monitor Superfund cleanup sites from space, track coastal erosion, and help high-tech prospectors search for minerals worldwide — all far more cost-effectively and efficiently than traditional methods can do the job," Goldin said.

The CTA team proposal calls for development, construction and operation of a satellite which combines a very high resolution optical element with stereo imaging capabilities for \$49 million.

"The CTA satellite is designed to locate utility pipelines and cables from the sky, help city planners evaluate their transportation needs and problems, and help developers and contractors assess construction sites," Goldin said.

Both spacecraft will carry additional instruments that will provide global atmospheric pollution dynamics information for Mission to Planet Earth. In addition, the sensors on both spacecraft also provide science data for space physics and cosmic-ray astronomy.

My ancestors came from

Return this form to: Pat Burke, Equal Opportunity Office
Mail Code AJ

Scientists respond to Phase One research announcements

With NASA offering early microgravity research opportunities aboard Russia's Mir space station, science teams from across the country have responded to the opportunity to conduct space station precursor experiments during four extended astronaut visits to Mir between 1995 and 1997.

Some 129 research teams have submitted proposals to the space agency in response to a NASA research announcement. The proposals are directed at research in environmental monitoring; biomedical applied physiology; human factors; fundamental biology on humans, animals and plant life; and for research to develop advanced technologies for life support.

"We think this is a good indication of the interest within the science community for carrying out meaningful

research aboard the International Space Station," said Victor Schneider, of the Life and Biomedical Sciences Applications Division. "These NASA-Mir proposals are strictly for station-type research — 90 to 180 days in duration."

According to the research announcement: "knowledge of the effects of gravity on humans, other animals, and plants, as well as elucidation of the basic mechanisms by which these effects occur, will be of direct benefit to the quality of life on Earth through applications in medicine, biotechnology, plant biology and human activities dependent on understanding biological processes; and understanding the impact of, and providing countermeasures for, long-term exposure of humans to the microgravity of space flight."